



## MEMO

TO	Francesco Di Stefano, Environment Agency
FROM	Environmental Resources Management Limited
DATE	4 <sup>th</sup> November 2025
REFERENCE	0792240, Application reference EPR/CP3225SW/A001
SUBJECT	Aldbrough Hydrogen Pathfinder Permit Application - RFI Response – Air Quality

### **Response to EA Duly Making – Air Quality**

SSE Hornsea Limited (SSE) submitted a bespoke environmental permit application for the Aldbrough Hydrogen Pathfinder (AHP) facility, located at SSE's Albrough Gas Storage Site at Garton Road, East Riding of Yorkshire on 1<sup>st</sup> July 2025.

Following submission, the Environment Agency issued an information request as part of their duly making checks. Part of the request related to the **Air Quality Impact Assessment**. The specific requirements were listed in Point 7 of the request:

- The normalised volumetric flowrate used in the air dispersion modelling for emission point A1 and the actual O<sub>2</sub> and H<sub>2</sub>O concentration figures you have used to calculate the normalised flow rate.*
- An explanation, including statement of assumptions, of how you calculated a mass emission of 17.3 kg/hour of NO<sub>x</sub> from the flare events*
- A list of sensitive human health receptors and a clarification on whether the process contributions PCs have been calculated at discrete receptors' locations, maximum on grid or maximum off-site.*

This technical note has been prepared by ERM on behalf of the SSE, to provide the information requested by the Environment Agency. In this note, Section and Table references refer to report 'Appendix C – Aldbrough Hydrogen Pathfinder – Air Quality Impact Assessment – Final for Issue 17.04.25'.

### **Normalised volumetric flow rate for OCGT Stack (A1)**

The figures used to calculate the normalised volumetric flowrate are provided in the table below.

Parameter	Units	Value	Comments
Actual volume flow rate	Am <sup>3</sup> /s	319	
Actual emission temperature	°C	486	
Actual flue gas oxygen	%v/v	14.3	WET gas basis
Actual flue gas moisture	%v/v	8.75	

Parameter	Units	Value	Comments
Reference temperature	°C	0.0	
Reference moisture	%v/v	0.0	
Reference Oxygen content	%v/v	15	Dry gas basis
Normalised volume flow rate	Nm <sup>3</sup> /s	93.8	At reference conditions of 101.3 kPa, 273 K, 15% O <sub>2</sub> , 0% moisture

### **Estimation of flare NO<sub>x</sub> emission rate**

Estimation of flare NO<sub>x</sub> emission rate is based on the following methodologies:

- Alberta Environmental Sustainable Resource Development (ESRD) research (available at: <https://static.aer.ca/prd/documents/directives/Directive060.pdf>): The method uses the composition of the feed gas flow to the flare to calculate heat released as MJ/s; and
- Emission factors Data from USEPA AP-42 (available at: [https://www.epa.gov/sites/default/files/2020-10/documents/13.5\\_industrial\\_flares.pdf](https://www.epa.gov/sites/default/files/2020-10/documents/13.5_industrial_flares.pdf))

A copy of the calculations using this methodology is provided in Attachment A.

### **Process Contribution and Human Receptors**

The presented Process Contributions (PC) are the maximum values on the receptor grid, outside of the site fence line. Since the maximum PCs are assessed as insignificant, impacts at specific human health receptors will be lower still and have therefore been screened out of further detailed assessment.

## ATTACHMENT A AHP FLARE CALCULATIONS